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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/866,663	05/30/2001	Alfred I-Tsung Pan	10006771-1	5133

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HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

SCALTRITO, DONALD V

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 04/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/866,663

Applicant(s)

PAN, ALFRED I-TSUNG

Examiner

Donald V Scaltrito

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 12-24 is/are rejected.
- 7) ☒ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 14 & 22 are objected to because of the following informalities: The word deionized is spelled incorrectly as dionized in both claims. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Hockaday (U.S. Patent No. 5,631,099).

Hockaday discloses a compact, surface replica fuel cell that has a fiber reinforced porous central membranes and two porous outer membranes wherein a catalyst layer and a metal film layer are deposited on both sides of the central membrane (note abstract). With respect to Claim 12, Hockaday teaches a series of fuel cells produced on thin, flexible layers that can bend and form non-planar shapes (see column 4, lines 55-65 of this reference; see also Figure 17). Hockaday goes on to teach that the electrodes are positioned on each side of the membrane in the fuel cell and that each electrode comprises a catalyst layer and a thin metal film layer (column 9,

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lines 54–65). Hockaday teaches that the catalyst layer and the thin metal film layer are provided with pores to allow for fuel distribution (column 11, lines 12-49). The Examiner would like to point out that the flexible anode and cathode electrodes as disclosed by Hockaday are being interpreted as a first and second flexible substrate that have catalyst and thin metal film layers disposed thereon. The membrane disposed between the anode and cathode is being interpreted as a separation section. With respect to Claim 13, Hockaday teaches that the membrane can be an ion exchange membrane (column 7, lines 35-39). With respect to Claim 14, Hockaday teaches that the membrane can allow for water diffusion (column 13, lines 18-41). With respect to Claim 15, Hockaday teaches that the fuel cell can be formed into a cylindrical shape (Figure 17). With respect to Claims 16 & 17, Hockaday teaches that the interior of the cylindrically shaped fuel cell system contains fuel and that the fuel can be methanol (column 11, lines 50-56).

With respect to Claim 19, Hockaday teaches a means for converting liquid fuel into protons. The first and second means for supporting the liquid fuel converting means is interpreted as the anode and cathode electrodes, which are, as previously explained, flexible substrates. Hockaday teaches that the protons are converted to water molecules and eventually into water vapor (column 13, lines 18-41). With respect to Claim 20, Hockaday teaches a thin metal film layer that is porous and capable of transporting liquid fuel (column 11, lines 12-49). With respect to Claim 21, Hockaday teaches the use of an ion exchange membrane (column 7, lines 35-39). With respect to Claim 22, Hockaday teaches that the membrane can allow for water diffusion (column 13, lines 18-41). The Examiner would like to point out that this is being interpreted as a water channel. With respect to Claim 23, Hockaday teaches a method of making a flexible circuit comprising the steps of: placing a conductive material on a flexible substrate,

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attaching a layer of porous material onto the conductive material and depositing a catalytic layer on the porous material (column 17, lines 36-59). Hockaday also teaches that laser ablation can be used to expose the surface of the flexible circuit (column 7, lines 52-67). With respect to Claim 24, Hockaday teaches the deposition of a hydrophilic coating and the Examiner interprets this as a proton transfer membrane.

This reference, therefore, anticipates Claims 12-17 & 19-24 of the current application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hockaday, as applied to claims 12-24 above, and further in view of Todd et al. (U.S. Patent No. 6,197,145).

Hockaday teaches all of the limitations as described above under the 35 U.S.C. 102(b) rejections section. Hockaday fails to teach or fairly suggest, however, the disposition of a dry film adhesive between two flexible substrates.

Todd et al. teach a method of attaching flexible plastic films having electronic circuitry placed thereon wherein a dry film adhesive is employed. Todd et al. specifically disclose that three flexible substrates were tested with various dry film adhesives (see column 6, line 58 – column 7, line 4 of this reference). Todd et al. teach that using the correct dry film adhesive to

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secure flexible circuits together can lead to an increased reliability and durability of the electronic circuit assemblies (column 3, lines 14-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention as a whole was made to modify the invention of Hockaday by incorporating a dry adhesive film between flexible substrates with electronic circuitry disposed thereon, as taught by Todd et al., because Todd et al. teach that adhering flexible substrates together can lead to increased reliability and durability of electronic circuit assemblies.

Allowable Subject Matter

Claims 1-11 are allowed. The following is a statement of reasons for the indication of allowable subject matter: The prior art or record fails to teach or fairly suggest flexible substrates that comprise a plurality of openings wherein an anode or cathode electrode is disposed between the flexible substrate and a porous catalytic layer. Furthermore, the prior art or record fails to teach or fairly suggest a fuel side flexible circuit that is disposed in parallel with an air/water side flexible circuit.

Conclusion

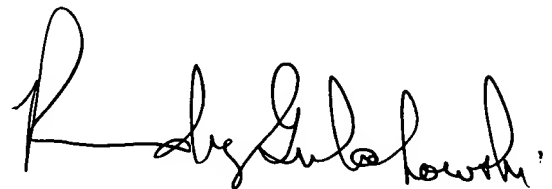
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald Scaltrito, whose telephone number is 703.305.4926. The examiner can be reached in his office on Monday-Friday between the hours of 9am to 6pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski, may be reached at 703.308.4333. The official fax number for the organization where this application or proceeding is assigned is 703.305.3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661

Donald Scaltrito
Patent Examiner
Art Unit 1746
April 17, 2003

A handwritten signature in black ink, appearing to read "Randy Gulakowski", is written over a horizontal line.

RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700